

PLATINUM PERSPECTIVES

Low supply growth from recycled platinum will not offset lower mine supply in 2020

Recycling contributes a quarter of total annual platinum supply (c.2 moz of c.8 moz). **The nature of this secondary supply of platinum makes its rate of growth steady and largely unresponsive to price.**

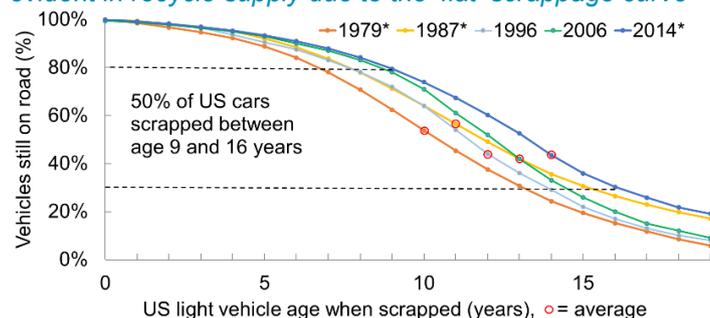
The c.2 moz of annual secondary supply comprises c.1.5 moz from autocatalyst recycling (84% from Europe & North America) and c.500 koz from jewellery recycling (90% from China & Japan), (Figure 2&4, Page 2).

While average light vehicle life in the US (chart below left) and in the EU increased to 14 years in 2014, typically only 50% of vehicles are scrapped between the ages of 9 and 16 years. This scrappage profile dilutes past rapid changes in Platinum Group Metal (PGM) loadings per vehicle over several years of recycle supply. In addition, because the risk to recycling margin of PGM price changes is very high, participants typically fully hedge price, keeping margins almost constant. Consequently, the rate of recycle supply hardly changes as PGM prices do. This is illustrated for palladium autocatalyst recycle supply in the chart below right.

Recycle supply from jewellery typically follows price but in China (72%) selling-back jewellery for recycle is traditionally done to upgrade to newer and larger pieces. This practice in China, and because there is no mature cash-for-recycle platinum market, results in recycle volumes following new jewellery sales. (Figure 3, Page 2)

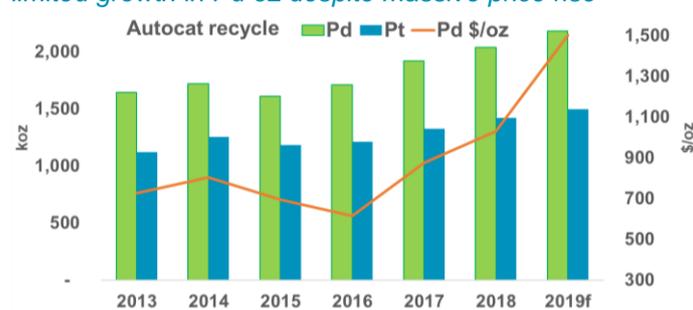
Recycling growth has slowed for the past three years as the growing autocatalyst component has been offset by declining jewellery recycling. (Figure 1, Page 2) Our 2020 forecast ([Platinum Quarterly Q3'19](#)) reflects a continuation of this trend with autocatalyst supply up 2% to 1.53 moz and jewellery recycling down 5% to 460 koz. Consequently, **secondary supply is not expected to make up for lower South African mine supply (-3% or -150 koz) next year.**

Rapid changes in past PGM loadings per car are far less evident in recycle supply due to the 'flat' scrappage curve



Source: WPIC Research, US Department of Transportation 1969-2014, year shown is end of study period, * years 14-19 based on 1996 and 2006 longer studies, average is year of peak scrappage

Pt & Pd autocat recycle supply follow past loadings; limited growth in Pd oz despite massive price rise



Source: Bloomberg, SFA (Oxford), WPIC Research

Recycling of platinum in industrial applications is almost solely 'closed loop' (ownership retained by the user) and does not impact supply demand balances. One exception is the 5 – 10 koz pa of electronic scrap recycled.

Recycling of palladium from autocatalysts has been suggested as a source of supply to offset the ongoing deficits in the palladium market. (Figure 6, Page 2). **Despite the palladium price rising from below \$700/oz to over \$1,800 /oz since 2016, its recycle supply largely followed expected growth** based on historic vehicle loadings and scrappage profiles. This lack of price response has further heightened concerns of availability of palladium and increased the likelihood for substitution of palladium by platinum.

Note: Public data on vehicle scrappage rates beyond 2014 is rare due to its high value to vehicle aftermarket businesses. Long term scrappage profiles were hardly affected by material scrappage schemes after the 2008 global economic crisis. Similarly, changes since Dieselgate in 2015 have not disrupted the nature of autocatalyst recycle supply.

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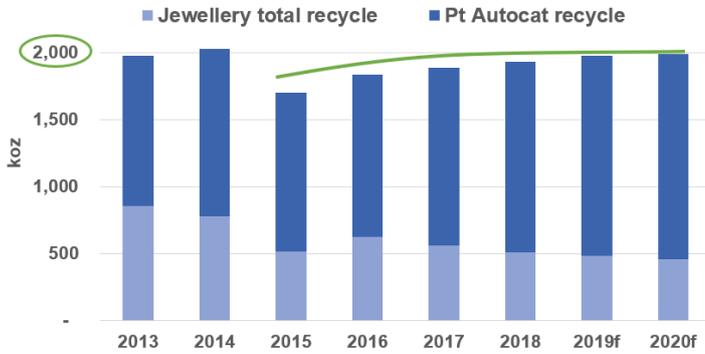
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Platinum's attraction as an investment asset arises from:

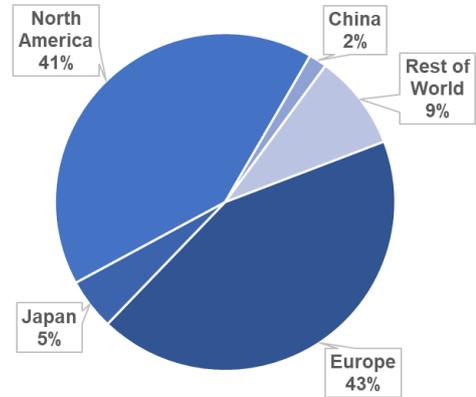
- Supply is relatively constrained with limited investment in new platinum group metal (PGM) mines
- Platinum price is at all-time lows relative to gold and to palladium
- Total PGM demand growth should continue due to increasingly restrictive emissions rules
- Market balance mismatches between palladium and platinum argues for substitution
- Investment demand has surged as institutions begin to factor low price and positive fundamental outlook

Figure 1: Recycling has seen little growth recently as higher autocatalyst has been offset by lower jewellery



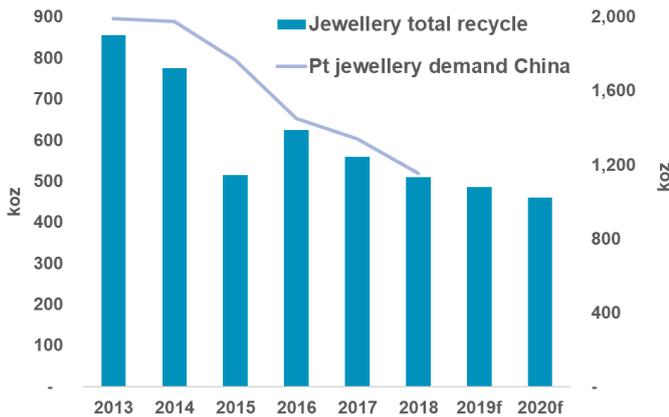
Source: SFA (Oxford), WPIC Research

Figure 2: Autocatalyst recycling (2018, 1,42 moz) by region – Europe and North America dominant



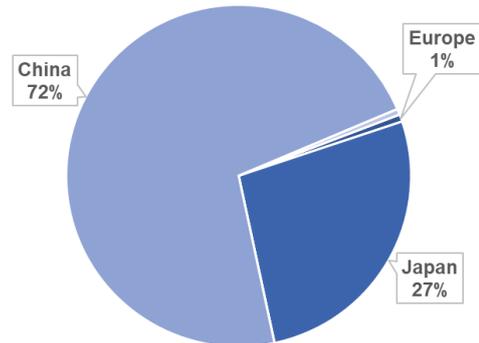
Source: SFA (Oxford), Johnson Matthey, WPIC Research

Figure 3: Platinum jewellery recycling total (koz, lhs) and platinum jewellery demand in China (koz, rhs)



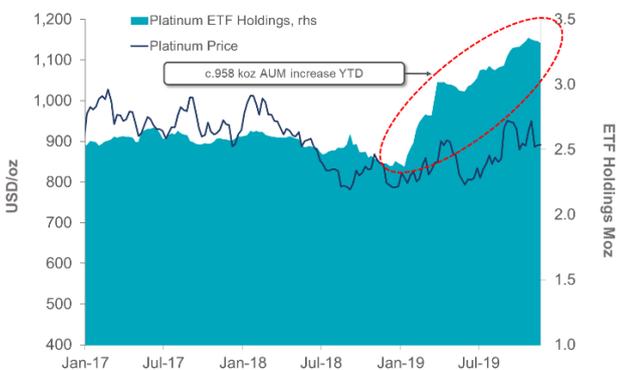
Source: SFA (Oxford), WPIC Research

Figure 4: Jewellery recycling (2018, 510 koz) by region – almost all from China and Japan



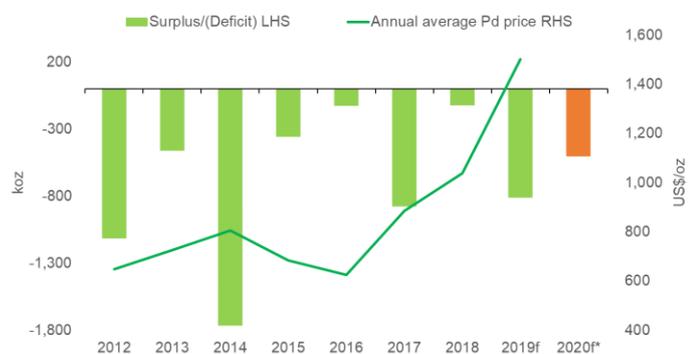
Source: SFA (Oxford), Johnson Matthey, WPIC Research

Figure 5: Platinum ETF holdings up 958 koz year-to-date as long-term investors act on demand growth potential



Source: Bloomberg, WPIC Research, as at 29 November 2019

Figure 6: Palladium entering ninth consecutive deficit. Recycling does not reduce the likelihood of substitution



Source: Johnson Matthey, Bloomberg, 2020f* Norrnickel, WPIC research

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